



New Mexico Legislative Council Service Retirement System Solvency Task Force

Presentation of Actuarial Review Findings for PERA and ERB

October 12, 2010

Purpose of an Actuarial Review

- Provide another actuary's opinion on the actuarial soundness of New Mexico PERA and ERB
- Confirm that the actuary's calculations are right
- Get ideas on how to do things differently / better
- Exercise fiduciary obligation
 - Recommend independent review be completed periodically (once every four to five years)
 - Confirm funded status and contribution rates

Scope of Actuarial Review

- Review the work of the New Mexico PERA and ERB actuaries, GRS
 - Pension systems for PERA including Magistrate, Judicial and Volunteer Firefighters
 - Limited scope review performed
- Technical scope review
 - Review of membership data
 - Review of sample member calculations
 - Review of sample benefit calculations
 - Review recent experience analysis
 - Review actuarial valuation results
- Assess completeness and validity of membership data
- Comment on reasonableness of actuarial assumptions, methods and procedures
- Determine whether valuation procedures are technically sound
- Determine if generally accepted actuarial standards are being followed
- Review actuaries' reports
- Review experience analysis reports

Principal Findings of Actuarial Review

Review of Member Data

Missing or Unreasonable Data

- Comparison of raw and processed data for active members indicates there are a large number of records reported by PERA that are not included in GRS's valuation
- Missing or unreasonable data rates moderate for most PERA plans
 - Volunteer Firefighters have large number of “defective records”
 - Adjustments made for missing dates of birth appear reasonable
- Missing or unreasonable data rates moderate for ERB. Adjustments stated in valuation report appear reasonable

Missing Item	PERA	Judicial	Magistrate	Volunteer Firefighters	ERB
Date of Birth	7,298	3	1	843	2,326
Gender	7,151	2	2	831	0
Service	5,912	3	5	2,262	1
Pay Rate	9,136	20	6	N/A	0

Principal Findings of Actuarial Review

Review of Member Data (cont.)

- Recommend following changes/review for System provided data
 - Include date of hire and date of termination on the active file
 - Include termination reason codes, including non-vested, vested termination and reduced/unreduced retirement
 - For joint & survivor options, include a separate field showing the pop-up amount
 - Include remaining contribution balance for calculation of modified cash refund benefits

Principal Findings of Actuarial Review

Review of Asset Smoothing Method

- Features of asset smoothing methods
 - Years in smoothing period
 - Corridor around MVA
- According to the NASRA Public Fund Survey, 57% of plans use five-year smoothing, 17% use four-year smoothing
- ASOP No. 44 requires use of a method that:
 - Uses a corridor around Market Value to keep Actuarial Value within a reasonable range of Market, or
 - Recognizes differences between Actuarial and Market within a reasonable period of time
- Actuarial Value of Assets replicated using alternative approach for each System

Principal Findings of Actuarial Review

Review of Asset Smoothing Method - PERA

- PERA

Asset Smoothing Method		
Plan	Smoothing Period	Corridor
PERA Fund	4 years	N/A
Judicial	4 years	20%
Magistrate	4 years	20%
Volunteer Firefighters	4 years	N/A

- Four-year smoothing, may consider moving to a five-year smoothing period

\$ millions	PERA Fund	Volunteer Firefighters
AVA / MVA ratio	143%	142%
Increase to the Unfunded Liability if 120% corridor	\$ 2,020	\$ 7.4

- More than 40% of recent investment losses not yet recognized in AVA

Principal Findings of Actuarial Review

Review of Asset Smoothing Method

- PERA (cont.)
 - Asset valuation method does not lead to full recognition of gains and losses after four years

Year Ending June 30th	Current Asset Valuation Method				Asset Valuation Method Recognizing Expected Return on Existing Bases			
	Existing Bases	Market Value	Actuarial Value	Difference	Existing Bases	Market Value	Actuarial Value	Difference
2009	\$ (3,779,323,046)	\$ 8,795,819,080	\$ 12,575,142,126	\$ (3,779,323,046)	\$ (3,779,323,046)	\$ 8,795,819,080	\$ 12,575,142,126	\$ (3,779,323,046)
2010	(2,316,255,238)	9,960,191,717	12,276,446,955	(2,316,255,238)	(2,089,495,853)	9,960,191,717	12,049,687,570	(2,089,495,853)
2011	(1,005,697,447)	10,611,305,401	11,617,002,848	(1,005,697,447)	(715,549,209)	10,611,305,401	11,326,854,610	(715,549,209)
2012	(79,607,594)	11,303,176,724	11,382,784,318	(79,607,594)	148,970,925	11,303,176,724	11,154,205,799	148,970,925
2013	(91,329,460)	12,038,373,523	12,129,702,983	(91,329,460)	-	12,038,373,523	12,038,373,523	-
2014	(28,778,022)	12,819,587,577	12,848,365,599	(28,778,022)	-	12,819,587,577	12,819,587,577	-
2015	(6,972,013)	13,649,679,305	13,656,651,318	(6,972,013)	-	13,649,679,305	13,649,679,305	-
2016	(3,396,032)	14,531,688,547	14,535,084,579	(3,396,032)	-	14,531,688,547	14,531,688,547	-
2017	(1,058,204)	15,468,846,069	15,469,904,273	(1,058,204)	-	15,468,846,069	15,468,846,069	-
2018	(338,774)	16,464,585,810	16,464,924,584	(338,774)	-	16,464,585,810	16,464,585,810	-
2019	(130,576)	17,522,557,952	17,522,688,528	(130,576)	-	17,522,557,952	17,522,557,952	-
2020	(42,550)	18,646,642,851	18,646,685,401	(42,550)	-	18,646,642,851	18,646,642,851	-
2021	(14,552)	19,840,965,898	19,840,980,450	(14,552)	-	19,840,965,898	19,840,965,898	-
2022	(5,187)	21,109,913,360	21,109,918,547	(5,187)	-	21,109,913,360	21,109,913,360	-
2023	(1,745)	22,458,149,290	22,458,151,035	(1,745)	-	22,458,149,290	22,458,149,290	-
2024	(604)	23,890,633,557	23,890,634,161	(604)	-	23,890,633,557	23,890,633,557	-
2025	(211)	25,412,641,094	25,412,641,305	(211)	-	25,412,641,094	25,412,641,094	-
2017	(72)	27,029,782,433	27,029,782,505	(72)	-	27,029,782,433	27,029,782,433	-
2018	(25)	28,748,025,622	28,748,025,647	(25)	-	28,748,025,622	28,748,025,622	-
2019	(9)	30,573,719,620	30,573,719,629	(9)	-	30,573,719,620	30,573,719,620	-
2020	-	32,513,619,282	32,513,619,282	-	-	32,513,619,282	32,513,619,282	-

- Recommend changing to method that leads to full recognition of gains and losses by the end of the smoothing period

Principal Findings of Actuarial Review

Review of Asset Smoothing Method - ERB

- New Mexico ERB
 - Five-year smoothing
 - No corridor
 - Adopting a 20% corridor would increase the unfunded liability \$830 million
 - AVA/MVA ratio 132%
 - More than 30% of recent investment losses not yet recognized in AVA
- Actuarial Value of Assets replicated using alternative approach
- Asset valuation method is reasonable and leads to full recognition of gains and losses after five years

Principal Findings of Actuarial Review

Review of Actuarial Cost Method - PERA

- Entry Age Normal Cost Method
 - Benefits based on pay for PERA (except Legislative and Volunteer Firefighters), Judicial and Magistrate
 - Cost separated between past and future service
 - 79% of public plans use Entry Age Method (2008 Wisconsin survey)
- Normal cost determined as a level percentage of pay or level dollar amount
 - Level percent of pay amount increases as member pay increases
 - Represents annual cost of accruing benefits for service worked
- Unfunded Liability develops if past service liability exceeds assets
- Actuarial contribution equals Normal Cost plus amortization payments for Unfunded Liability
- Unfunded liability amortized over an open 30-year period
 - Meets GASB No. 25 parameters
- Actuarial gains/losses create volatility in actuarial contribution rates

Principal Findings of Actuarial Review

Review of Actuarial Cost Method - ERB

- “Modified” Entry Age Normal Cost Method
 - Normal Cost is determined for a hypothetical group of new entrants
 - Based on actual new entrants for five-year period ending June 30, 2004
 - Normal Cost rate stays the same until a new hypothetical group is determined
 - No longer widely used
 - For some states, it was required by statute
 - Easy to calculate before computerized data processing
- GRS has set the Normal Cost rate as the cost for the new tier of members who have yet to be hired
 - No members with this benefit structure included in the actuarial valuation
 - Normal Cost rate fully reflects the new tier of benefits
- Based on GASB language, we do not believe the “Modified” Entry Age meets GASB parameters
- We recommend GRS use the conventional Individual Entry Age Normal Method

Review of Other Valuation Issues

Sample Benefit Calculations

- Reviewed 40 calculations for PERA
 - Samples from each coverage plan and System
 - We reasonably matched the results
 - Calculations matched data provided by PERA for valuations
 - One calculation was not reported for the valuation by PERA, recommend research to identify any potential problems in valuation data extract
 - Two calculations appear to use more than 36 months in calculation of final average pay
 - Recommend PERA review these calculations
- Reviewed 3 calculations for ERB
 - We reasonably matched the results
 - Calculations matched data provided by ERB for valuations

Review of Other Valuation Issues

Funded Ratio and Contribution Rate Projections

- Reviewed limited output from 5 year projection for PERA (excluding Legislative)
 - Based on statutes in place as of June 30, 2008
 - Results appear reasonable
 - Does not appear that analysis was split between current members and future members
- Reviewed output from 30 year projections for ERB
 - Based on current statutes, including the change in retirement eligibility for future new hires
 - Results appear reasonable
 - GRS assumes all non-vested terminations will take a refund in the first year of projections
 - This is a reasonable assumption for a valuation but we would recommend assuming a slower payout of refunds for projection purposes

Review of Other Valuation Issues

Sample Member Calculations

- We review sample member calculations from the actuary's valuation system to determine if benefits are valued accurately and correct assumptions are used
- We were unable to obtain sample member calculations for PERA before this meeting
- Reviewed sample calculation from the June 30, 2009 actuarial valuation for ERB
 - We were able to reasonably match GRS's results
 - We recommend the following modifications to improve accuracy:
 - Value termination death benefits for actives and terminated vested members
 - Value the greater of a refund or annuity for active death benefits
 - These are minor improvements and will not significantly impact plan liabilities

Review of Other Valuation Issues

Content of Actuarial Valuation Reports

- New Mexico PERA
 - Changes in assumptions and methods should be stated and their effect noted in the report
 - Show gain/loss analysis by source
 - Include reconciliation of participant data from the prior year
 - Show historical Market Value of Assets and returns on AVA and MVA
 - Clarify description of payroll shown in reports
 - Clarify description of loads for data corrections
 - Describe the assumed commencement age for deferred vested members
- New Mexico ERB
 - Show gain/loss analysis by source

Review of Actuarial Valuation Assumptions & Experience Studies

- Actuarial assumptions are used to quantify expected future payments
 - Should be individually reasonable
 - Should be based on an analysis of experience
 - No one right answer
 - Best estimate range of reasonableness

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Mortality
 - Healthy mortality - PERA
 - Post-retirement mortality based on 1971 Group Annuity Mortality
 - Projected mortality improvements to 2000
 - Adjustments of seven years back for females and three years back for males
 - The table provides appropriate level of conservatism for female
 - GRS did not improve mortality for males because of potential data issues
 - Pre-retirement mortality table appears appropriate
 - Recommend GRS provide description of the pre-retirement mortality table
 - Healthy mortality - ERB
 - Post-retirement mortality based on 1994 Uninsured Pensioners Mortality
 - Adjustments of two years back for females and three years back for males
 - The table provides appropriate level of conservatism for males and females
 - Pre-retirement mortality table appears appropriate
 - GRS did not change this assumptions because of small sample size and possible data issues
 - Projecting mortality improvements beyond valuation date with less setback recommended for both PERA and ERB
 - Suggest considering generational tables in the future

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Retirement Rates
 - Ages where actual retirements greater than expected are not conservative

	A/E ratio before	A/E ratio after
PERA		
State General – Male Age Based	111%	112%
State General – Male Service Based	173%	154%
State General – Female Age Based	123%	116%
State General – Female Service Based	169%	152%
State Police – Age Based*	22%	22%
State Police – Service Based*	99%	84%
State Hazardous Corrections – Age Based	67%	73%
State Hazardous Corrections – Service Based	213%	104%
Municipal General – Male Age Based	132%	117%
Municipal General – Female Age Based	95%	94%
Municipal General – Service Based	173%	151%
Municipal Police – Age Based*	107%	107%
Municipal Police – Service Based	216%	194%
Municipal Fire – Age Based*	63%	83%
Municipal Fire – Service Based	173%	148%
Magistrate	400%	228%
Judicial	123%	125%
Volunteer Firefighters	9%	17%
ERB – Males	103%	No Change
ERB – Female	102%	No Change

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Retirement Rates (cont.)
 - PERA
 - Separate rates set by age and eligibility for unreduced/reduced benefits
 - Proposed changes to rates based on experience
 - Recommend additional review of rates for service based rates for State General and Municipal General, Police and Fire
 - ERB
 - Separate rates set by age and eligibility for unreduced/reduced benefits after 25 years of service
 - Did not analyze eligibility for unreduced benefits at age 60 with 75 points
 - No change to assumption
 - Recommend additional review of rates for members meeting the rule of 75

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Other Demographic Assumptions
 - Withdrawal rates and refund assumption - PERA
 - Proposed changes to rates based on experience
 - Generally reasonable
 - Recommend reviewing refund assumption during next experience analysis
 - Withdrawal rates and refund assumption - ERB
 - No change to assumption
 - Generally reasonable
 - GRS values greater of refund or vested termination benefit
 - Disability rates
 - Rates are reasonable

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Other Demographic Assumptions (cont.)
 - Disabled Mortality – PERA
 - No change to assumption
 - Generally reasonable
 - Recommend GRS provide better description of table used
 - Disable Mortality - ERB
 - No change to assumption
 - Disabled mortality based on 1981 Disabled Mortality Table
 - Generally reasonable considering small sample size

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Proposed Inflation Assumption
 - Rates between 3.0% and 3.5% are reasonable

10-year Period ending	Wage Inflation
12/31/1969	2.32%
12/31/1979	7.08%
12/31/1989	5.52%
12/31/1999	2.92%
12/31/2009	2.65%
Last 50 years	4.10%

- GRS proposed a change from 4.0% to 3.5% for PERA and no change to 3.0% assumption for ERB
 - Does not appear the recommended change from 4.0% to 3.5% for PERA was adopted
 - We agree with the recommended change for PERA

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

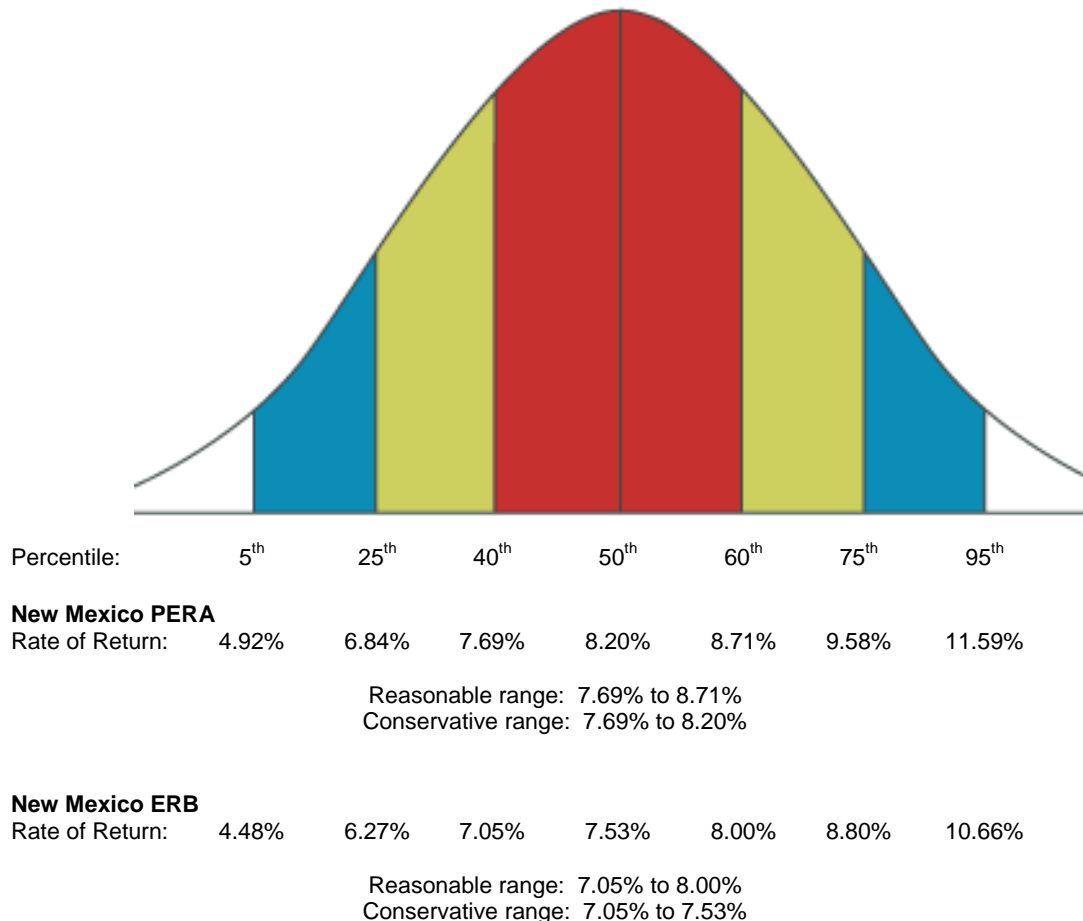
Asset Class	PERA Policy Allocation Target	ERB Policy Allocation Target	Buck Assumptions	
			Arithmetic Mean of Real Return	Standard Deviation
Domestic Equity	40.0%	25.0%	6.03%	18.48%
International Equity	25.0%	20.0%	6.61%	20.07%
Fixed Income	25.0%	20.0%	2.23%	4.94%
Real Estate	1.5%	5.0%	4.40%	6.93%
Absolute Return/Hedge Funds	3.5%	10.0%	4.85%	12.50%
Private Equity	3.5%	10.0%	10.85%	32.00%
Real Assets/Inflation Linked	1.5%	5.0%	3.50%	7.76%
Global Tactical AA	0.0%	5.0%	5.20%	16.91%
Total	100.0%	100.0%		

	PERA		ERB	
	Buck	GRS	Buck	GRS
Real Rate of Return Expectation	4.50%	4.12%	4.83%	5.41%
Inflation	4.00%	4.00%*	3.00%	3.00%
Gross Rate of Return Expectation	8.50%	8.12%	7.83%	8.41%
Expenses	(0.30%)	N/A	(0.30%)	(0.30%)
(Conservatism)/Aggressiveness	(0.20%)	(0.12%)	0.47%	(0.11%)
Net Rate of Return Expectation	8.00%	8.00%	8.00%	8.00%

*Assumed

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Investment Return reasonable range within the 40th and 60th percentile



Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Proposed Investment Return
 - PERA
 - No change recommended to 8.0% assumption by GRS
 - Buck's reasonable range based on asset allocation is 7.69%-8.71%
 - Buck's 50th percentile rate of return is 8.20% based on 4.0% inflation and 0.3% expenses
 - Buck's analysis suggests a lower inflation and lower investment return assumption
 - ERB
 - No change recommended to 8.0% assumption by GRS
 - Buck's reasonable range based on asset allocation is 7.05%-8.00%
 - Buck's 50th percentile rate of return is 7.53% based on 3.0% inflation and 0.3% expenses
 - Buck's analysis suggests a higher inflation or lower investment return assumption
 - Recommend continuous monitoring of returns and economic assumptions
 - Recommend reconsidering this assumption after magnitude of the expected economic recovery is known, or whenever asset allocation policy is changed

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Salary Scale Components
 - Inflation
 - Productivity

10-year Period ending	Wage Inflation	Price Inflation	Productivity
12/31/1969	4.33%	2.32%	2.01%
12/31/1979	6.89%	7.08%	(0.19%)
12/31/1989	5.76%	5.52%	0.24%
12/31/1999	4.25%	2.92%	1.33%
12/31/2009	3.10%	2.65%	0.45%
Last 50 years	4.86%	4.10%	0.76%

- Merit / Step / Longevity

Review of Actuarial Valuation Assumptions & Experience Studies (cont.)

- Salary Scale
 - PERA
 - No salary scale for Legislative or Volunteer Firefighters since benefits are not pay related
 - 4.5% wage inflation consists of 4.0% inflation and 0.5% productivity
 - Rates generally reasonable
 - Recommend that merit and inflation be separated for next analysis
 - ERB
 - No change to assumption
 - GRS indicated they did not have the proper data to analyze salary increase because of the three-tier licensure program
 - 5.0% wage inflation consists of 3.0% inflation and 2.0% productivity
 - These rates are very conservative
 - Experience indicates merit may have been higher than expected
 - Recommend lowering productivity to 1.5% and increase inflation to 3.25%
 - Recommend that merit and inflation be separated for next analysis

Conclusions

- Demographic assumptions are generally reasonable and reflect system experience; some instances we recommend further review
- Buck recommends both PERA and ERB review economic assumptions given recent economic crisis, extent of economic recovery, and generally lower inflation and investment return expectations
- Asset valuation method is appropriate for ERB, properly applied and reasonable
 - Recommend change to same AVA method for PERA so converges to MVA sooner
 - PERA may consider removing corridor for Judicial and Magistrate if method change adopted
- For Plans without a corridor, actuarial value of assets is between 32% and 43% more than market value; should be aware of difference between Market Value and Actuarial Value and short term impact on Funded Status, Funding Periods and Actuarial Contribution Rates
- Recommend GRS use the conventional Individual Entry Age Normal Method for ERB
- Buck's review of PERA not complete
 - Waiting for test case information

Determining Solvency

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Defining Solvency

- One approach is to meet a 30-year amortization objective in accordance with GASB standards

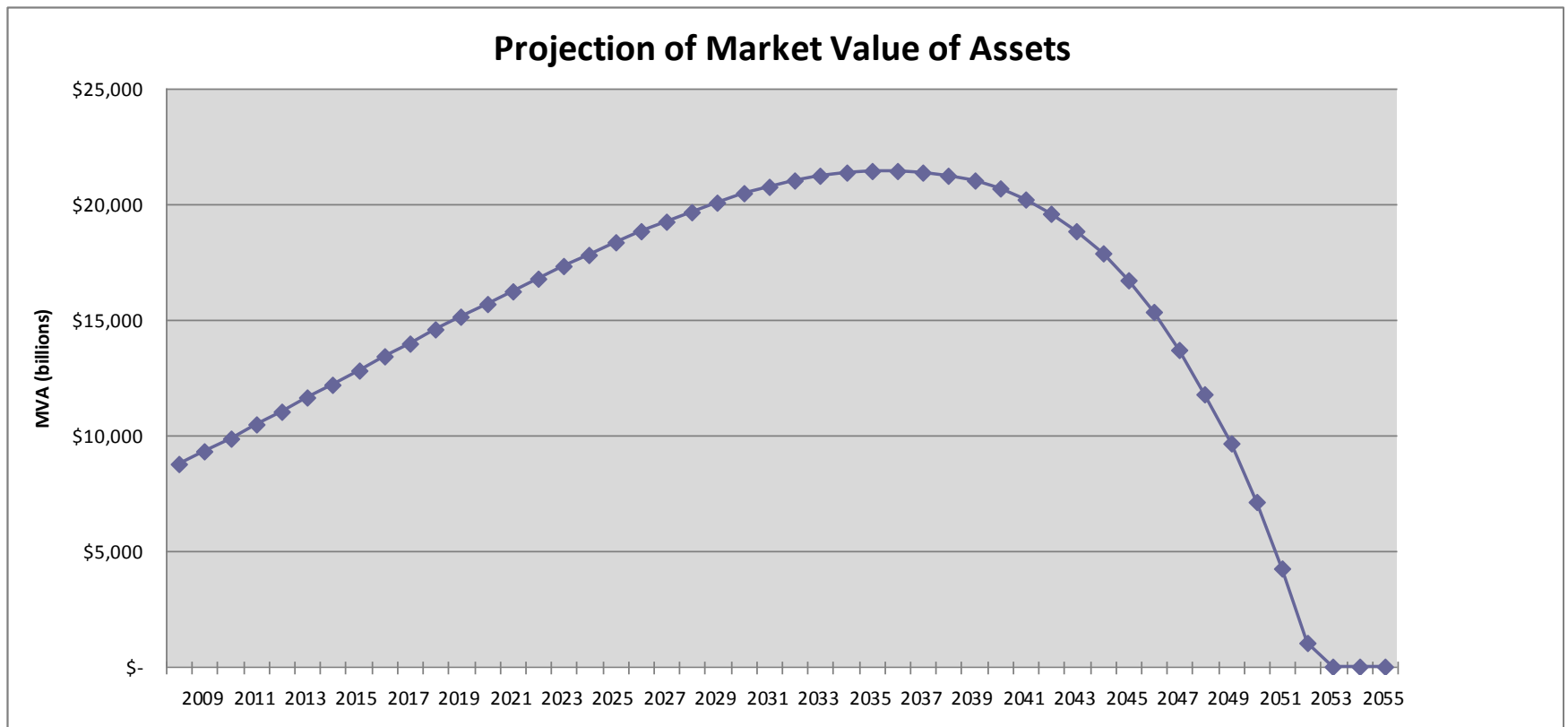
	Employer Contribution Rate	
	<u>Statutory</u>	<u>30-Year</u>
PERA Fund	13.97%	16.04%
ERB	10.90%	12.45%

Defining Solvency (cont'd)

- Another approach is to project Market Value balances using expected contributions, investment return and benefit payments
 - Assumes expected investment rate of return and salary increases
 - Assumes open group (new members hired to place retiring and terminating members)
 - Assumes statutory contribution rates are paid
 - May assume increasing active membership
- System is “insolvent” if assets fully depleted during the projection period

Defining Solvency (cont'd)

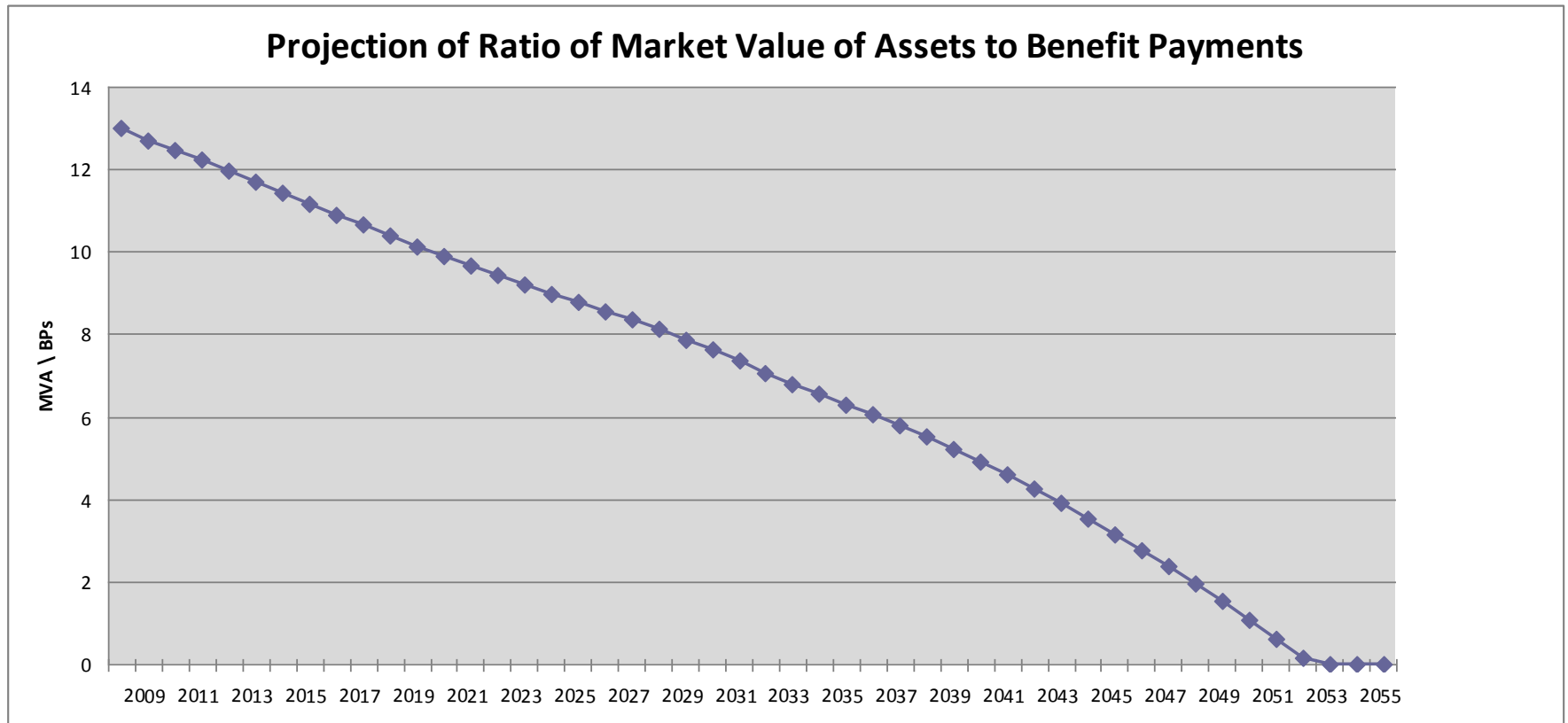
PERA



Based on open group projections with no population growth provided by GRS.

Defining Solvency (cont'd)

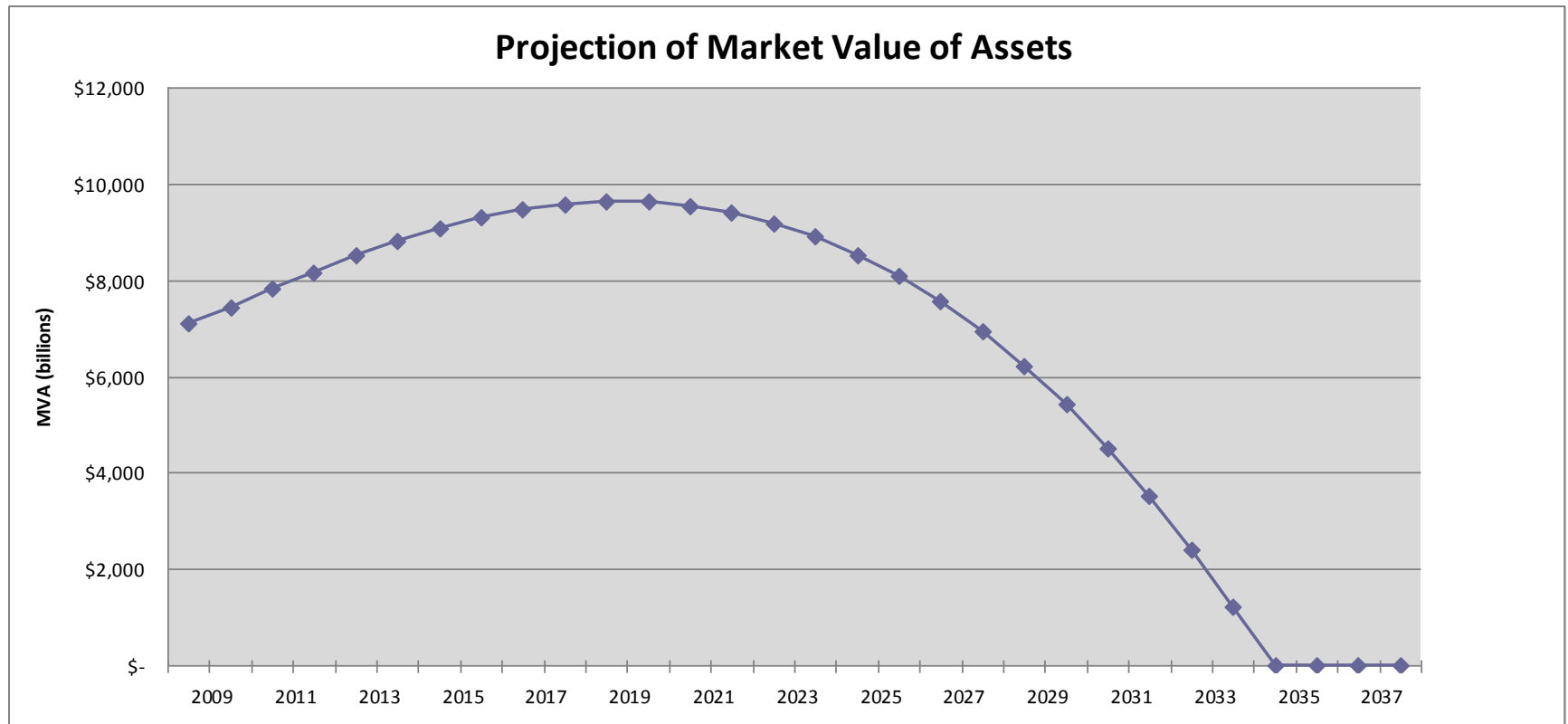
PERA



Based on open group projections with no population growth provided by GRS.

Defining Solvency (cont'd)

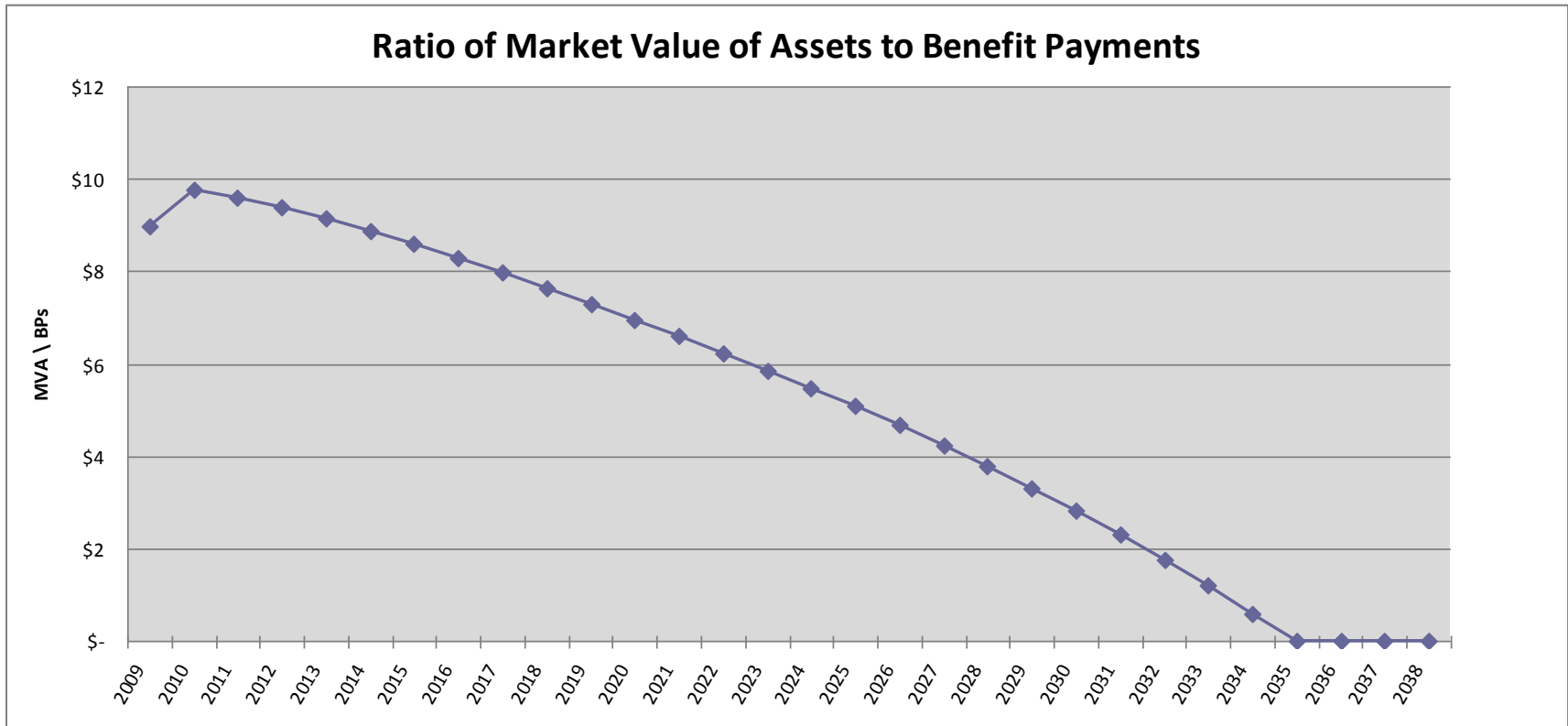
ERB



Based on closed group projections provided by GRS with 3.75% salary growth.

Defining Solvency (cont'd)

ERB



Based on closed group projections provided by GRS with 3.75% salary growth.



Questions?

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